

Tilapia Mossambica Peters, from Australia

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In June 1969 three specimens of *Tilapia* were received from Dr W. J. R. Lanzing of the University of Sydney, Australia. These were identified as *Tilapia mossambica* Peters, but, in view of the lack of knowledge regarding the origin of their ancestors, a detailed study of these specimens was carried out by Mr F. O. Petrick at the Provincial Fisheries Institute, Lydenburg. This morphological study included direct comparison with specimens of *Tilapia mossambica* from Transvaal waters.

As stated by Atz (1954), just how and when *Tilapia* left Africa and reached the East Indies is a mystery. Its presence in East Java was discovered in 1939 by an overseer of fisheries, Pak Mudjair by name, who explained that the new fish was collected in a small lagoon of the Serang River on the south coast of Java. This strange fish, subsequently identified as *Tilapia mossambica* Peters, became very popular with Javanese fish culturists and fingerlings were transported to various places all over the island. In honour of its discoverer the fish was named "Ikan Mudjair", which in Indonesian means Mudjair's Fish. This new introduction soon made itself at home in a wide variety of habitats, both natural and artificial, and it thrived in both brackish and fresh waters.

During World War II the Japanese army of occupation distributed *Tilapia mossambica* widely, and by the end of the war this species was established in the islands of the East Indies and parts of south-east Asia. *Tilapia* are on the list of forbidden imports of live fish into Australia but Dr Lanzing was able to obtain stock for research purposes from Singapore. It is reasonable to assume that the Singapore stock originated from Java.

Petrick's detailed morphological comparison of the Australian specimens with Transvaal material follows:

BODY RATIOS

	Far East <i>T. mossambica</i>		Transvaal <i>T. mossambica</i>	
	Range	Mean	Range	Mean
Mouth width/Head width	0.641—0.8917	0.7777	0.65—0.83	0.76
Body length/Body depth	2.538—2.875	2.682	2.59—3.0	2.73
Body length/Head length.	2.511—2.933	2.773	3.0 —3.2	3.08
Head length/Snout length	2.420—2.969	2.655	2.2 —2.8	2.46
Head length/Eye diameter	4.63 —5.232	4.954	5.5 —6.1	5.8
Head length/Postocular part of head	2.262—2.5	2.421	2.2 —2.5	2.31
Head length/Interorbital width	3.0 —3.358	3.149	2.6 —2.64	2.6
Head length/Head width	1.753—1.953	1.860	1.7 —1.9	1.8
Postocular part of head/Eye diameter	2.0 —2.093	2.048	2.3 —2.6	2.47
Interorbital width/Eye diameter	1.5 —1.667	1.575	1.9 —2.3	2.14
Mouth width/Eye diameter	1.707—2.367	2.142	2.0 —2.8	2.4
Postocular part of head/Snout length	0.968—1.3125	1.103	0.9 —1.30	1.06
Snout length/Eye diameter	1.561—2.163	1.889	2.0 —2.7	2.36
Snout length/Body length	0.117—0.151	0.1335	0.11—0.148	0.1315
Mouth width/Head length	0.368—0.475	0.422	0.36—0.43	0.41
Gut length/Body length		5.9	4.42—8.6	7.0
Lateral length lower pharyngeal/Width of lower pharyngeal		1.342	1.29—1.34	1.31
Length of premaxillary pedicle/diagonal length of premaxilla		50%		

SCALE COUNTS

Lateral line	30—32	30—31
Lateral line to middle of back	3—3½—4	4
Lateral line to middle of belly	13—15	14—16
Round caudal peduncle	16	16
Predorsal scales	9—12	10—12

GILL—RAKER COUNT

Number of gill-rakers on lower portion of anterior arch	18	18
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JUBB AND PETRICK: TILAPIA MOSSAMBICA PETERS, FROM AUSTRALIA

INTERNAL ANATOMY

	Far East <i>T. mossambica</i>	Transvaal <i>T. mossambica</i>
I. Vertebral Column		
Precaudal vertebrae	15	15
Caudal vertebrae	15	15—16
Total number of vertebrae	30	30—31
Number of pleural ribs	12—13 pairs	13 pairs
Number of epineurals	2 pairs	2 pairs
Number of epipleurals	6 pairs (last two very thin)	6 pairs
Ventral vertebral apophysis	on third vertebra	on third vertebra
Anterior articular facets on first vertebra		5
II. Ray counts on Fins		
Dorsal:		
spines	16—17	15—16
branched rays	11 (eleventh double with small second)	11—12
pterygiophores	27—28	25—26
Anal:		
spines	3	3
branched rays	10	9—10
pterygiophores	12	11
Caudal:		
dorsal half:		
spines	6	4 and few more
branched rays	7	7
ventral half:		
spines	6	4 and few more
branched rays	7	7
dorsal and ventral caudal apophysis	present	present
Pelvic:		
spines	1	1
branched rays	5	5
Pectoral:		
spines	1	1
branched rays	11—12	11—12
Central caudal fin skeleton:		
epurals	3	3
hypurals	5	5
uroneurals	2 pairs	2 pairs
III. Teeth on Jaws		
(a) on upper jaw:		
Outer series	62	60—64—90
Second series	64	70—75—88
Third series	60	46—60—66
Fourth series	14	44—56—66
Fifth series		up to 43
Sixth series		up to 20
(b) on lower jaw:		
Outer series	48	60—80—94
Second series	40	48—52—62
Third series	24	32—40—52
Fourth series	20	24—32—46
Fifth series		up to 28
Sixth series		up to 26
IV. Pharyngeal Teeth		
(a) on upper pharyngeals:		
Each anterior pharyngeal	9—12	12—16
Each posterior pharyngeal	circa 300	250—300
(b) on lower pharyngeals:		
Total number on both bones together	250—300	360—400

The teeth on upper and lower jaws: The outer series is bicuspid with the mesial cusp large and the lateral cusp short and small. The more posterior teeth are unicuspid, as the lateral cusp has not yet been developed. (In many Transvaal *T. mossambica* many or even most of the teeth of the outer series are unicuspid and remain so in large mature specimens). Inner series have all tricuspid teeth with central cusp the longest and largest.

The pharyngeal teeth are all bicuspid with large outer and very small inner cusp (according to the bent shape of the cusp part of the tooth). Only the lateral ones are small and slender. The posterior ones are the largest and stoutest. The medial and even anterior ones are fairly stout and large. In comparison with Transvaal *T. mossambica* the teeth are wider spaced over the pharyngeal bones and proportionally a little coarser, even the anterior ones.

REMARKS

From a study of the body ratios it is evident that the Australian specimens have a slightly shorter snout length. In relation to the size of the fish the eye diameter is a constant factor for both samples. Regarding the other ratios the differences are slight. These may be attributed to the differences in sizes of the samples (Australian 11—13 cm, Transvaal 18·7—22·5 cm), length of time in preservative, and the fact that the Australian specimens were aquarium bred.

For the Transvaal specimens the ratio of gut length to body length was found to be from 4·4—8·6, thus the ratio for one Australian specimen of 5·9 fits in quite well.

The ventral vertebral apophysis on the third vertebra of the Australian specimens conforms to that found in the Transvaal specimens, in that the right and left apophysis have met distally and united to form a foramen through which the dorsal aorta passes. A short, but stout spine is formed on this arch. The retractor pharyngeal muscles and the swim-bladder are attached to this arch and spine.

All the internal organs: gonads, swimbladder, liver and kidneys are the same as have been described (Petrick, 1967, unpublished manuscript) for Transvaal *T. mossambica*. Regardless of the slight difference in body ratios the Australian specimens are considered to represent the species *Tilapia mossambica* Peters.

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JUBB AND PETRICK: TILAPIA MOSSAMBICA PETERS, FROM AUSTRALIA

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